

U.S. Population Estimates by Age, Sex, Race, and Hispanic Origin: July 1, 2003

The U.S. Census Bureau produces estimates of total resident population for the United States on an annual basis. The estimates time series is revised each year as final input data become available. These postcensal estimates from April 1, 2000 through July 1, 2003 supersede all previous estimates produced since Census 2000. The following documentation describes the work that was carried out in the production of the July 1, 2003 total resident population estimates at the national level.

Population Universe

Estimates of the U.S. resident population include persons resident in the 50 states and the District of Columbia. They exclude residents of the Commonwealth of Puerto Rico, and residents of the outlying areas under U.S. sovereignty or jurisdiction (principally American Samoa, Guam, Virgin Islands of the United States, and the Commonwealth of the Northern Mariana Islands). The definition of residence conforms to the criterion used in Census 2000, which defines a resident of a specified area as a person "usually resident" in that area. Estimates of resident population exclude the U.S. Armed Forces overseas, as well as civilian U.S. citizens whose usual place of residence is outside the United States.

Estimates of the resident population plus Armed Forces overseas include U.S. residents and members of the Armed Forces on active duty stationed outside the United States, but do not include military dependents and other U.S. citizens living abroad.

Civilian population estimates include U.S. residents not in the active duty Armed Forces. The difference between resident population plus Armed Forces overseas and civilian population is the worldwide Armed Forces population.

Estimates of the civilian noninstitutional population differ from the civilian population. Civilian noninstitutional population estimates exclude persons residing in institutions, primarily nursing homes, prisons and jails, mental hospitals, and juvenile correctional facilities.

The Census 2000 Base Population

The enumerated resident population in Census 2000 is the base for the post-2000 population estimates. The enumerated population was modified in two ways for purposes of developing these estimates. First, the race data were modified to eliminate the "Some other race" category in order to be more consistent with race categories that appear on the administrative records used to produce the population estimates. Second, the April 1, 2000 population estimates base reflects changes to the Census 2000 population due to the Count Question Resolution program, legal boundary changes reported nationwide from the Boundary and Annexation Survey (BAS), Census 2000 errata, and other administrative changes.

The race modification conforms to the Office of Management and Budget's (OMB) 1997 revised standards for collecting and presenting data on race and ethnicity. The revised OMB standards identified five minimum race categories: White; Black or African American; American Indian and Alaska Native; Asian; and, Native Hawaiian and Other Pacific Islander. Additionally, the OMB recommended that respondents be given the option of marking or selecting one or more races to indicate their racial identity. Finally, for respondents unable to identify with any of the five race categories, the OMB approved including a sixth category – "Some other race" – on the Census 2000 questionnaire.

No modification was necessary for responses indicating only an OMB race alone or in combination with another race. However, about 18.5 million people checked "Some other race" alone or in combination with another race. These people were primarily of Hispanic origin and many wrote in their Hispanic origin or Hispanic origin type (such as Mexican or Puerto Rican) as their race. For purposes of estimates production, responses of "Some other race" alone were modified by blanking the "Some other race" response and imputing an OMB race alone or in combination with another race response. The responses were imputed from a donor, who matched on response to the question on Hispanic origin. Responses of both "Some other race" and an OMB race were modified by blanking the "Some other race" response and keeping the OMB race response.

The resulting race categories (White; Black; American Indian and Alaska Native; Asian; and, Native Hawaiian and Other Pacific Islander) conform with OMB's 1997 revised standards for the collection of data on race and ethnicity and are more consistent with the race categories in other administrative sources, such as vital statistics.

Postcensal estimation of resident population by sex, race, and Hispanic origin

Estimates of the U.S. population by sex, race, and Hispanic origin, were derived quarterly by updating the modified Census 2000 population with data on the components of population change. The following formula was applied to update each group:

- (1) 2000 enumeration of resident population,
- (2) + births to U.S. resident women,
- (3) - deaths to U.S. residents,
- (4) + net international migration,
- (5) + net movement of U.S. Armed Forces.

Estimation of the components of population change by race and Hispanic origin

Births

Data on registered births to U.S. residents by birth month, sex of child, and race and Hispanic origin of mother and father were supplied by the National Center for Health Statistics (NCHS). Final data were available through 2001 and preliminary data were available for 2002.

Registered births to U.S. resident women were estimated from data supplied by NCHS. At present, NCHS continues to collect birth certificate data using the 1977 race standards of White; Black; American Indian, Eskimo or Aleut; and Asian or Pacific Islander, under the "mark one race" scenario. To produce post-2000 population estimates, it was necessary to develop birth data that coincided with the new race categories: White; Black; American Indian and Alaska Native; Asian; and Native Hawaiian and Other Pacific Islander, under the "mark one or more races" scenario. Because of this inconsistency in data on race, it was necessary to model the full 31 possible single and multiple race combinations.

Data on births by birth month, sex, and race and Hispanic origin of the mother and father are based on final micro-data files for calendar year 2001 from the NCHS registration system. The model was based on information from Census 2000 on race and Hispanic origin reporting within households for the age zero (under 1 year of age) population and their parent(s). First, the NCHS births were tabulated for each of the combinations of parents' race and Hispanic origin. These births by parents' race and Hispanic origin were then distributed according to the Census 2000 race and Hispanic origin distribution for the age zero population for the matching combination of parents' race and Hispanic

origin. Race and Hispanic origin modeling was done separately for mother-only and two-parent households.

To estimate the distribution of births for calendar year 2002, data on preliminary 2002 births received from NCHS from their 90 percent sample of final births were distributed according to the 2001 births by birth month, sex and modeled race and Hispanic origin.

To estimate the distribution of births by race and Hispanic origin of mother for the first half of 2003, age-specific birth rates centered on July 1, 2002, for women in each race group and for women of Hispanic origin were applied to preliminary estimates of the number of resident women in the specified age groups.

Deaths

Data on registered deaths to U.S. residents by death month, age, sex, race and Hispanic origin were supplied by NCHS. Final data were available through 2001 and preliminary data were available for 2002.

It was again necessary to model the race distribution because death certificates ask for the race of the deceased using only four race categories (1977 race categories of White; Black; American Indian, Eskimo or Aleut; Asian or Pacific Islander). Separate death rates were calculated for the 1977 race categories by age, sex, and Hispanic origin. Rates were constructed using the 1998 mortality¹ and 1998 population estimates.² These rates were then applied to the July 2001 population in the 31 modified race categories from the Vintage 2002 estimates. Death rates for the White, the Black, the American Indian, Eskimo or Aleut, and the Asian and Pacific Islander groups were applied to the corresponding White alone, Black alone, American Indian and Alaska Native alone, Asian alone, and Native Hawaiian and Other Pacific Islander alone populations. The Asian and Pacific Islander death rate was applied to both the Asian alone population and the Native Hawaiian and Other Pacific Islander alone population. Multiple race deaths were estimated as the difference between total 2001 deaths as reported by NCHS and the sum of deaths estimated for the single race groups. Consequently, a constant death rate was applied to each of the 26 multiple race groups.

The 2002 deaths were distributed using 2001 deaths by modeled race, death month, age, and sex and were controlled to the 2002 preliminary deaths from NCHS by Hispanic origin.

To estimate the distribution of deaths by race and Hispanic origin for the first half of 2003, projected age-specific mortality rates for July 1, 2002 were applied to preliminary 2003 estimates of the population by group year of age, sex, race, and Hispanic origin.

International Migration

The net international component combines three parts: (1) net migration of the foreign-born, (2) emigration of natives, and (3) net movement from Puerto Rico to the United States. In an effort to

¹ The race distribution for the 1998 deaths as set in the processing of the national estimates is used here because it adjusts for NCHS/Census race inconsistencies. In the production of national population estimates in the 1990s, preliminary deaths to the American Indian, and Asian and Pacific Islander populations by sex were projected using life tables, with proportional adjustment to sum to the other races total. Hispanic origin deaths by sex and race were estimated for all years using life tables applied to a distribution of the Hispanic population by age, sex, and race.

² The 1998 population estimate from the vintage 2000 population estimates.

maximize the use of available data, we used the American Community Survey (ACS) as the basis for the level of net migration of the foreign born between 2000 to 2001 and 2001 to 2002 because it provided annually updated data. After determining the level of migration for the foreign born (the net difference between two time periods for the foreign-born population), we accounted for deaths to the entire foreign-born population during the periods of interest to arrive at the final estimate of net migration of the foreign born. We applied the age-sex-race-Hispanic origin-county distribution of the non-citizen foreign born from Census 2000 who entered in 1995 or later to the national-level estimate of net migration of the foreign born.

The remaining two parts of the net international migration component, the net movement from Puerto Rico to the United States and the emigration of natives, were produced in similar ways.³ For both parts, we do not have current annually updated information. Therefore, we used the levels of movement used in the previous year.⁴ For both parts, we applied the age-sex-race-Hispanic origin-county distributions from Census 2000 that were most similar to the population of interest. For the net movement from Puerto Rico, the underlying distribution was based on those who indicated that their place of birth was Puerto Rico and had entered the United States in 1995 or later. We assumed that natives who emigrated were likely to have the same distributions as natives who currently reside in the United States. Therefore, the characteristics of natives who emigrated was assumed to be the same age-sex-race Hispanic origin-county distribution as natives residing in the 50 states and the District of Columbia in Census 2000.

Once the net migration of the foreign born, net movement from Puerto Rico, and emigration of natives were estimated, all three parts were combined to estimate a final net international migration component. Adding up the parts of net international migration, the net migration of the foreign born (1,300,000) plus the net migration from Puerto Rico (+ 11,133) minus the net emigration of natives (-18,012) yielded 1,293,121 as the annual estimate for net international migration.

Armed Forces

For the Armed Forces overseas statistics, distributions by sex, race, and Hispanic origin were derived from separate tabulations provided by the Defense Manpower Data Center (Department of Defense), giving demographic detail by duty location and branch of service.

Estimation of the Population by Quarter and Month

The calendar quarter is the basic time interval for estimating distributions of components of change by age, sex, race, and Hispanic origin.

For the most part, the data sources for the demographic components of change provide monthly data. For some preliminary data, monthly series were imputed by projection of seasonal distributions from final data for earlier years. Most Armed Forces strength data by branch of service, used to estimate movement of Armed Forces from overseas, are available by month, whereas data on all Armed Forces

³ For more information on the net movement from Puerto Rico and native emigration see Kevin E. Deardorff and Lisa Blumberman, 2001, "Evaluating Components of International Migration: Estimates of the Foreign-Born Population by Migrant Status in 2000," Population Division Working Paper Series No. 58.

⁴ For more information on the estimate of 11,133 for the net movement from Puerto Rico see Christenson, M. "Evaluating Components of International Migration: Migration Between Puerto Rico and the United States," Population Division Technical Working Paper No. 64. For information on estimates of native emigration see Gibbs, J. G. Harper, M. Rubin, and H. Shin, "Evaluating Components of International Migration: Native-Born Emigrants," Population Division Technical Working Paper No. 63.

demographic detail are available by quarter. No seasonal information was available for net migration of the foreign-born, emigration of natives, and net movement from Puerto Rico to the United States, so no seasonality was assumed. For births and deaths, quarterly distributions by age, sex, race, and Hispanic origin were independently derived. For other components, sex, race, and Hispanic origin distributions were imputed to quarterly data either from the current calendar year or fiscal year, or on the basis of a projection from a past year.

The procedure for estimating the population by quarter, once the quarterly components of change were estimated, followed the component accounting procedure described earlier. The single-year age distribution of the base population was further distributed to quarter-year of age in proportion to registered births in the birth year of each birth cohort.

To complete the population estimates for the months that do not begin a calendar quarter, monthly series were estimated of births, deaths, and immigration, by sex, race, and Hispanic origin. Aggregate monthly components--births, deaths, and movement of Armed Forces overseas--were expanded to month-of-birth from quarterly data. International migration data were distributed evenly throughout the months. The resulting monthly series of components were used to produce the monthly population estimates.